

QUARTERLY REPORT

FOR APRIL THROUGH JUNE 1995

OPERABLE UNIT 2
IM/IRA SURFACE WATER
FIELD TREATABILITY UNIT

PREPARED BY

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ENVIRONMENTAL RESTORATION PROJECTS

Attachment 1
Page 1 of 14

ADMIN RECORD

APR 27 1995

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Quarterly Operations Report for April Through June 1995

for the

Operable Unit No 2 IM/IRA Field Treatability Unit

1 0 INTRODUCTION

This report covers operations at the Operable Unit Number 2 (OU 2) Field Treatability Unit (FTU) for the second quarter of 1995

The FTU initiated operations in accordance with the Interim Measure/Interim Remedial Action (IM/IRA) under the Plan released by the Department of Energy (DOE) on May 8 1991. The FTU began operation as Phase I for treatment of surface water from a portion of the South Walnut Creek drainage at OU-2 for removal of volatile organic compounds (VOCs) of concern. The Phase I system consisted of collection facilities at Surface Water locations SW59 and SW61 equalization tankage bag pre filters Granular Activated Carbon (GAC) treatment units and insulated heat traced transfer piping pumps and controls. Phase I was conducted between May 13 1991 and April 27 1992 at which time the Radionuclides Removal System (RRS) and collection of SW132 was implemented under the Phase II program. The RRS added provisions for treatment of radionuclides and metals by pH adjustment chemical precipitation and cross flow membrane filtration. The RRS replaced bag pre filters as pretreatment to the GAC system. Detailed descriptions of the FTU and its operation can be found in the IM/IRAP (Interim Measure/Interim Remedial Action Plan), the Sampling and Analysis Plan (SAP) and related documentation. The Field Treatability Study Phase II (March 1994) for the South Walnut Creek Basin Surface Water Interim Measure/Interim Remedial Action report contains a detailed operating history of the FTU prior to this reporting period. The Environmental Protection Agency (EPA) and Colorado Department of Public Health and the Environment (CDPHE) authorized discontinuation of collection of two of the three surface water stations SW61 and SW132 on April 24 1994. Collection was discontinued on May 6 1994.

2 0 TREATMENT FACILITY PERFORMANCE

2 1 QUANTITY OF WATER TREATED

A total of 31 851 gallons of water were treated at the FTU during this reporting period. The water treated consisted of 9 620 gallons of SW59 water 12 200 gallons of decontamination pad water 190 gallons of groundwater well purge water and rainwater pumped from the secondary containment areas.

The FTU was designed to collect surface water from three sources, SW59 SW61 and SW132. Collection occurs twenty four hours per day, 365 days per year, except for periods discussed in Section 2.7. Collected water is stored in a ten thousand gallon double walled equalization tank until enough water is present to justify initiating a batch treatment. Collection of SW61 and SW132 was discontinued on May 6, 1994, after the EPA and CDPHE concurred with DOE's request to discontinue collection and treatment of these sources. While previous sampling has shown contamination at the two sites below Applicable or Relevant and Appropriate Requirement (ARAR) levels, the two sources will continue to be sampled to verify that no increase in contamination is present. Quarterly sample data for SW61 and SW132 will be presented in this report and future quarterly reports. Table 1 contains ARARs for the OU-2 FTU.

The significant reduction in the volume of treated water at the FTU is presented in Graph 1. Graph 1 also indicates the excess capacity available at the facility since collection and treatment of SW61 and SW132 is no longer required. The FTU is capable of treating 60 gallons per minute continuously.

GRAPH 1

OU2 FTU Water Treated/Month

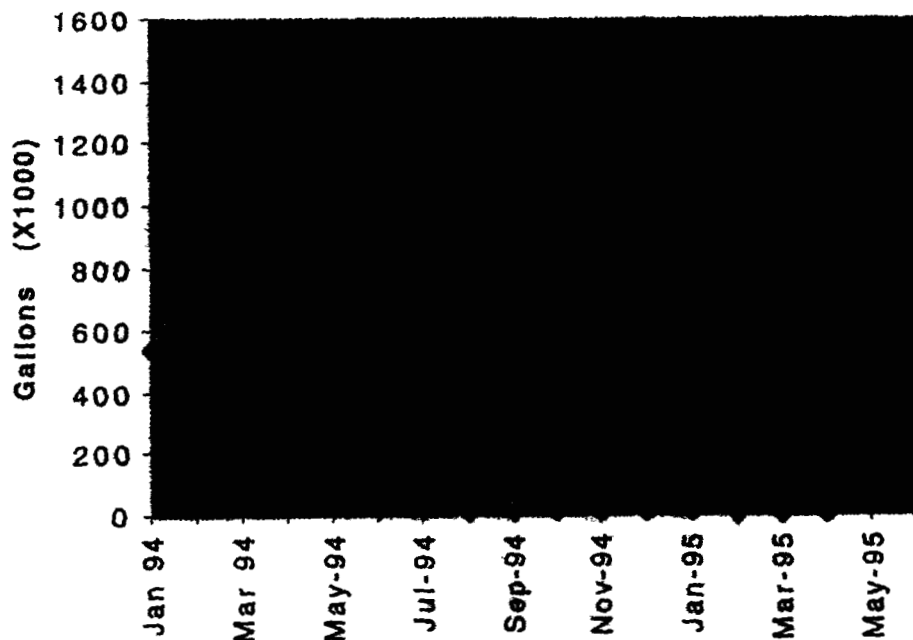


TABLE 1
Surface Water Contaminants
Identified in the South Walnut Creek Basin IM/IRAP^{1 2}

<u>Analyte</u>	<u>Unit</u>	<u>ARAR</u>
Radionuclides		
Am 241	pCi/l	0 05
Gross alpha	pCi/l	11 00
Gross beta	pCi/l	19 00
PU 239/240	pCi/l	0 05
U total	pCi/l	10 00
VOCs³		
1,1-Dichloroethene	µg/l	7 00
Carbon Tetrachloride	µg/l	5 00
Chloroform	µg/l	1 00
Tetrachloroethene	µg/l	1 00
Trichloroethene	µg/l	5 00
Vinyl Chloride	µg/l	2 00
Metals-Dissolved		
Iron	µg/l	300 00
Manganese	µg/l	50 00
Metals-Total		
Aluminum	µg/l	200 00
Arsenic	µg/l	50 00
Barium	µg/l	1 000
Beryllium	µg/l	100 00
Cadmium	µg/l	5 00
Chromium	µg/l	10 00
Copper	µg/l	25 00
Iron	µg/l	1 000
Lead	µg/l	5 00
Manganese	µg/l	1 000
Mercury	µg/l	0 20
Nickel	µg/l	40 00
Selenium	µg/l	10 00
<u>Zinc</u>	<u>µg/l</u>	<u>50 00</u>

¹ From the IM/IRAP (DOE 1991)

² Only analytes with ARARs are presented

³ Analyzed by EPA Method 524.2

Not calculated in the IM/IRAP

The volume of water collected for treatment during this reporting period was as follows

Month	Total Gallons	Gallons/Day	Gallons/Minute
April	1 650	55	0 04
May	23,310	751	0 52
June	6 891	66	0 16

*The FTU treated decontamination pad water and significant quantities of water from secondary containment areas

2 2 CHEMICAL USAGE

Chemical usage at the FTU was as follows

Month	Sulfuric Acid	Calcium Hydroxide	Ferric Sulfate	Hydrogen Peroxide	Sodium Hydroxide
April	0 gal	0 lbs	0 lbs	0 gal	0 gal
May	0 gal	0 lbs	10 lbs	15 gal	0 gal
June	0 5 gal	0 lbs	0 lbs	0 gal	5 gal

Note Several chemicals are recorded as 0 gallons or pounds due to the small volume of water processed. These chemicals were used at normal concentrations, but preparation of chemical solutions for treatment was not required during the month.

2 3 WASTE GENERATION

Zero 55-gallon drums of filtered sludge was packaged during this reporting period

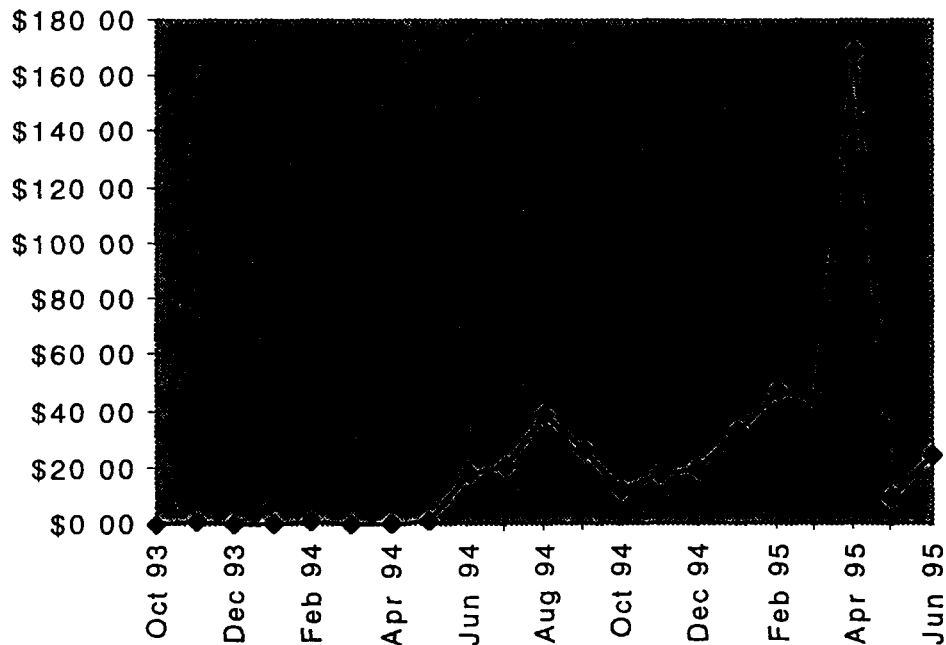
Two 55-gallon bags of used Personnel Protective Equipment (PPE) was generated during this quarter. The PPE is monitored for contaminants and if determined clean for unrestricted release, sent to the Rocky Flats Plant Landfill for disposal. To date, no PPE has been found to be contaminated.

2.4 OPERATING COSTS

The reduced volume of water that is collected and treated at the FTU has resulted in cost savings for sampling and chemical supplies. Modifications to reduce the subcontract started soon after collection and treatment of SW61 and SW132 was discontinued and was fully implemented in early October 1994. The cost/gallon of treated water at the FTU is presented in Graph 2 below. These costs include subcontract labor and operations costs, capital improvements (permanent power installation), Plant Support, mixed waste disposal (320 55-gallon drums), and Project Management. A significant increase in treatment costs/gallon of treated water can be attributed to the reduction in treated water since the FTU is a large capacity facility.

GRAPH 2

FTU \$/Gal for Treated Water



The large increase in treatment cost can be attributed to the reduction of SW61 and SW132. Operations at the FTU have been cut back as much as possible (manned operations have been reduced from 24 hour/day 7 days/week, to a 40 hour week), however, the cost/gallon to treat water cannot be reduced to the higher volume treatment costs. Monitoring of the tanks and piping that contain the untreated water cannot be eliminated, and preventive maintenance must be performed in order to keep the facility operational. Project Management has been reduced by approximately 80% to help reduce operations costs.

Monthly operating costs for *subcontractor labor and supplies* (including chemicals) were as follows:

April	\$20,600
May	\$26,300
June	\$29,600

Total monthly operating costs (burdened support labor, subcontract costs, equipment, and sampling) for the FTU are presented below:

April	\$279,000
May	\$217,000
June	\$172,000

The increased cost per gallon rate (only treating SW59) at the OU-2 FTU justifies treating the water in a different manner. A proposal to consolidate the OU-2 FTU and OU-1's Building 891 water treatment facilities. Discontinuation of collection and treatment of the 881 Footing Drain has been approved, providing OU-1 with excess capacity and increased treatment costs similar to that of the FTU. By consolidating the two facilities, treatment costs will be reduced and secondary waste production will be minimized. Any additional sources of water (non-RCRA) that can be treated at the new facility will help reduce the cost/gallon to treat the water. Consolidation of the two facilities is underway, with a current estimated completion date of late September, 1995. Preliminary data indicates that the consolidated facility will reduce OU-1 and OU-2 water treatment costs by \$1.2 million per year, and allow for treatment of large volumes of environmental wastewaters at a minimal cost.

2.5 POWER

Permanent overhead power replaced diesel power generation on July 8, 1994.

Backup power is provided to the FTU from a portable diesel generator that is wired into the power grid through a transfer switch. In the event of a power failure, the diesel generator will provide 100% of the power required to operate the facility. The generator is listed on the RFETS Air Pollution Emission Notice, and is operated one (1) hour per week for preventive maintenance concerns.

2 6 PREVENTIVE MAINTENANCE

During this reporting period a rigorous preventive maintenance program monitored all process equipment at the FTU. A preventive maintenance computer program tracks all planned maintenance activities and helps to assure that all equipment is properly maintained.

2 7 PERIODS OF NON-COLLECTION

Periods of non-collection are periods when the collection weir pumps cannot collect surface water (up to 60 gallons per minute) and transfer it to the equalization tank for storage and later treatment.

No periods of non collection have occurred since collection of SW 61 and SW 132 was discontinued on May 6 1994.

3 0 SAMPLING

3 1 SAMPLING OBJECTIVES

Sampling at the FTU is performed to characterize the influent surface water wastes and effluent water and to optimize FTU operations to minimize chemical consumption and waste generation. The IM/IRA identified specific contaminants of concern and established possible chemical specific ARARs as effluent standards for discharge of the treated water (ref Table 1 page 5).

Sample results contained in this report are representative of the previous quarter (January through March of 1995). Normal data turnaround time does not provide adequate results to fully report on the current quarter.

Sample results showing contaminants exceeding ARARs are presented below as well as contaminants not associated with ARARs that are present in the water stream above detection levels. Due to the decrease in the volume of collected and treated water sampling at the FTU has been reduced significantly.

Surface Water Division continues to characterize the three sampling locations (SW59 SW61 and SW132) associated with the FTU. Analytical results for the three sources are presented in the OU 2 FTU Quarterly Operations Report.

3 2 1 UNTREATED INFLUENT WATER FROM SW59

SW59 Radionuclides (January 1995 - March 23, 1995)

Data received from the samples taken at SW59 from January 1995 through March 1995 indicate that plutonium 239/240 exceeded its ARAR of 0.05 pCi/l on one occasion with a value of 0.14 pCi/l \pm 0.021 pCi/l.

The gross alpha ARAR of 11 00 pCi/l was exceeded on one occasion at SW59, with a value of 31 pCi/l \pm 5 3 pCi/l

The gross beta ARAR of 19 00 pCi/l was exceeded on one occasion at SW59, with a value of 21 pCi/l \pm 2 4 pCi/l

SW59 VOCs (January 1995 - March 23, 1995)

Chemical	Units	High	Average¹	ARAR
1,1-Dichloroethane	ug/L	0 5	0 4	None
1,1-Dichloroethene	ug/L	7	0 4	7
1,1 1-Trichloroethane	ug/L	3	1 2	None
Carbon Tetrachloride	ug/L	30	18 3	5
Chloroform	ug/L	9	6 5	1
Methylene Chloride	ug/L	3	0 1	None
Tetrachloroethene	ug/L	14	6 9	1
Trichloroethene	ug/L	10	6 5	5
cis-1 2-Dichloroethene	ug/L	17	12 9	None
Vinyl Chloride	ug/L	3	5	2

¹ Average value calculated by taking all values (for non-detect, 1/2 the detection limit was used) and dividing by the number of samples

SW59 Metals (January 1995 - March 23, 1995)

<u>Metal</u>	<u>Units</u>	<u>High</u>	<u>Average</u>¹	<u>ARAR</u>
Aluminum	ug/L	21 000	2 097	200
Iron	ug/L	12 100	One ARAR Exceedance	1 000
Lead	ug/L	23 2	One ARAR Exceedance	5
Manganese (Total)	ug/L	1 440	One ARAR Exceedance	1 000
Manganese (Dissolved)	ug/L	327	288 6	50
Zinc	ug/l	746	319	50

3 2 2 SURFACE WATER LOCATION SW61

SW61 Radionuclides (January 1995 March 23, 1995)

Data received from the samples taken at SW61 indicate that plutonium 239/240 exceeded its ARAR of 0 05 pCi/l on three occasions with values of 0 32 pCi/l \pm 0 03 pCi/l 0 3 pCi/l \pm 0 028 pCi/l and 0 11 pCi/l \pm 0 017 pCi/l

SW61 VOCs (January 1995 - March 23, 1995)

Carbon Tetrachloride exceeded its associated ARAR of 5 ug/l once with a value of 17 5ug/l

Chloroform exceeded its associated ARAR of 1 ug/l twice with both values of 2 ug/l

Tetrachloroethene exceeded its associated ARAR of 1 ug/L once with a value of 9 ug/l

Trichloroethene exceeded its associated ARAR of 5 ug/l once with a value of 7 ug/l

SW61 Metals (January 1995 - March 23, 1995)

Metal	Units	High	Average¹	ARAR
Aluminum	ug/L	1040	231	200
Iron (Total)	ug/L	1890	469	1 000
Lead	ug/L	5 7	One ARAR Exceedance	5
Zinc	ug/L	279	128	50
Iron (Dissolved)	ug/l	437	101	300
Manganese (Dissolved)	ug/l	368	81	50

¹ Average value calculated by taking all values (for non-detect, 1/2 the detection limit was used) and dividing by the number of samples

3 2 3 SURFACE WATER LOCATION SW132

SW132 VOCs (January 1995 - March 23, 1995)

Volatile Organic Compound data indicates no ARAR exceedances at sampling location SW132 between January 1995 and March 1995

SW132 Radionuclides (January 1995 - March 23, 1995)

Data received from the samples taken at SW132 from January 1995 through March 1995 indicate that no ARARs were exceeded

SW132 Metals (January 1995 - March 23, 1995)

Aluminum exceeded its ARAR of 200 ug/l three times, with values of 844 ug/l, 403 ug/l, and 233 ug/l

Iron exceeded its ARAR of 1,000 ug/l twice, with values of 1 380 ug/l and 1210 ug/l

Zinc exceeded its ARAR of 50 ug/l in eleven of twelve samples taken with an average value of 112 ug/l

3 3 RS-7 (TREATED EFFLUENT)

No radionuclides metals or VOCs exceeded ARARs at RS 7 during the January through March 1995 reporting period

4 0 OPERATIONS SUMMARY

The OU2 FTU continues to treat very small volumes of water. Although some increase in the volume of water treated was experienced last quarter, the facility is still operating below the capacity of the system. Therefore, the sitewide treatment facility concept continues to appear the most cost effective means of handling multiple sources (OU1, OU2, Decontamination pad) of water.

On May 17, 1995, the influent line to the OU2 influent tank was found to be flooded by heavy rains. The influent line had become dislodged from its normal anchor points. There was no apparent damage to the integrity of the influent line. However, rather than take a chance on further utilizing the line for transferring water from SW59, a temporary container has been set up at the site. This tank is transported to the OU2 equalization tank in order to ensure that there are no interruptions in the collection of SW59 water. A project is underway to install a permanent tank at the SW59 site. This will allow water to be shipped to the future sitewide treatment facility.

Sampling and characterization of SW 59, SW 61, and SW 132 continues.

5 0 ENVIRONMENTAL COMPLIANCE

No spills or releases to the atmosphere, secondary containment, or environment occurred during this reporting period.

6 0 REPORTS/CORRESPONDENCE

During this reporting period, no significant reports and/or documents that pertained to the OU-2 FTU were generated.

7 0 ANTICIPATED OPERATIONS FOR NEXT QUARTER

Normal operations are expected to continue next quarter with no expected shutdowns or periods of non-collection.

Collection of SW59 water in a portable tank will continue until the permanent tank installation is completed.

Phase II spent GAC will be sent offsite for reactivation or disposal.

Offsite shipment of mixed waste sludge and filter socks generated during operation of the FTU were begun last quarter and will continue.

Work will continue for consolidation of the OU-1 and OU-2 FTU water treatment facilities. Movement of the FTU chemical precipitation/microfiltration to the OU-1 treatment facility site will commence next quarter if approved by the regulatory agencies in an effort to reduce treatment costs and expand RFETS water treatment capabilities.

Sampling and characterization of SW59, SW61, and SW132 will continue.

A modification to the OU-2 FTU Interim Measure/Interim Remedial Action Plan will be made in order to consolidate the OU 1 and OU-2 water treatment facilities.

8 0 SUMMARY/CONCLUSIONS

The OU-2 FTU continues to collect and treat contaminated surface water from SW59 24-hours per day 365-days per year.

In order to reduce operating costs and provide additional treatment for most all environmental wastewaters the OU-1 and OU-2 treatment equipment will be consolidated at Building 891. The design for this project is underway, with an expected project completion date of late July, 1995. It is expected that this consolidation will result in savings of over \$1 million dollars per year.